

Applicant : Andrew RICHARDSON
Appl. No. : 10/581,379
Examiner : Michael S. Andler
Docket No. : 20305-4012

REMARKS

Reconsideration of this application, as amended, which comprises claims 1-9, 1-15 and 17, is respectfully requested.

A significant aspect of the invention, as reflected in amended independent claims 1 and 15, is that the slit in the metallic sheet element has a width "in the range of 0.2mm to 0.4mm. And to accurately provide a slit with such a narrow width range, Applicant's invention, as recited in amended independent claims 1 and 15, calls for the slit to have been formed "by chemical etching."

More specifically, it has been found that by making the width of the slit in the range 0.2mm to 0.4mm, a substantially increased depth of field occurs. This obviates the need to place the sheet bearing the barcode in direct contact with the barcode scanner. Thus for a scanner constructed in accordance with the invention, with a slit width of 0.3mm, a spacing of 4-5mm between the metallic sheet and the barcode e.g. on a banknote, can be tolerated. And in practice, the error rate in reading barcodes by the device according to the invention is extremely low as a result of a sharp image of the barcode being detected resulting from the substantial depth of field.

This contrasts with the description of Figures 21-22 of Oshima to which the Examiner has referred, which makes reference to a sheet pressing member 230 specifically designed to press the reading apparatus against the barcode. Furthermore, from Figure 40 and the comparative examples of Oshima, it can be seen that the distance b between the slit and the barcode is never greater than 1.5mm. Applicant's improved depth of field and consequential improved reading accuracy results from the slit being narrower than envisaged by Oshima. Indeed, in all of the examples given by Oshima in columns 27-29, the slit width (symbol e) is greater than 0.4mm and in comparative examples 2 and 3, it is given as 0.5mm.

The Examiner refers to column 30, line 40 of Oshima which states that the ratio of e/a should not be less than 0.6 in order to provide a sufficient signal to noise ratio. However, this calculation is only valid in the context of the examples given in the specification. Specifically,

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the value of a in the examples of Oshima is 1mm. It is respectfully submitted that it would not be obvious to those skilled in the art that the ratio e/a is valid for different values of a . Oshima does not disclose or suggest any basis for one to consider that this ratio holds true linearly for different values of a .

On page 5, line 1 of the Office Action, the Examiner has postulated a much smaller value of a of .33mm which he states to be the nominal UPC-A bar width. The use of this value of a for the expression $e/a < 0.6$ corresponds to a range of e of 0.19-0.46mm. Thus, the Examiner contends that Oshima anticipates the claimed range. However, a person skilled in the art would appreciate that the value of 0.6 is only valid at or around the values of a specified in Oshima and does not scale linearly as postulated by the Examiner. In any event, this is a measure of satisfactory S/N and is not related to depth of field directly. With all due respect, the Examiner's application of Oshima to anticipate Applicant's claimed slit width range is an impermissible use of hindsight.

With regard to chemical etching, it is specifically submitted that Oshima does not render obvious the use of chemical etching to achieve Applicant's slit width. First, Oshima provides no motivation to use the a narrow slit width range recited in Applicant's claims. While punching would be a suitable way to form the disclosed slit in Oshima, punching is not a suitable way of forming the much narrower slit used according to the invention. The punching tool soon wears out if made sufficiently thin to produce a narrow slit or becomes rounded and so does not provide a sharp edge to the slit, resulting in fuzziness of the detected barcode image. Similarly, laser cutting is not an acceptable choice. A laser burns a relatively large diameter hole initially and then forms a narrow slit extending from the hole resulting in a key hole shape rather than a linear slit.

In accordance with the invention, it has been found that chemical etching reliably provides a suitable narrow slit which achieves the depth of field advantages discussed above. The motivation to use chemical etching is certainly not evident or obvious based on the disclosure of Oshima which does not consider the advantages of using a much narrower slit.

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Based on the above, it is submitted that all the pending claims, as amended, are patentably distinct over the cited prior art, and withdrawal of the Examiner's rejections and allowance of all the pending claims is respectfully requested.

Conclusion

Prompt and favorable action on the merits of the claims is earnestly solicited. Should the Examiner have any questions or comments, the undersigned can be reached at (212) 506-5140.

Respectfully submitted,
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